HP StorageWorks Disk Array XP operating system configuration guide

XP48
XP128
XP512
XP1024

This guide describes the requirements and procedures for connecting the XP family of disk arrays to an IBM NUMA-Q system and configuring the disk array for operation with the DYNIX/ptx operating system.

hp invent

Contents

About this guide

This guide describes the requirements and procedures for connecting the XP family of disk arrays to an IBM NUMA-Q system and configuring the disk array for use with the DYNIX/ptx operating system.

Intended audience

This guide is intended for system administrators who have knowledge of the following topics:

- Data processing concepts
- Direct access storage device subsystems and their basic functions
- Disk arrays and RAID technology
- Operating system commands and utilities

Disk arrays

Unless otherwise noted, the term *disk array* refers to these disk arrays:

HP Surestore Disk Array XP512
HP Surestore Disk Array XP48
HP StorageWorks Disk Array XP128
HP StorageWorks Disk Array XP1024

Related documentation

HP provides the following related documentation:

- *HP StorageWorks Disk Array XP128: Owner's Guide*
- *HP StorageWorks Disk Array XP1024: Owner's Guide*

For information about operating system commands and third-party products, refer to the manufacturer's documentation.

Conventions

This guide uses the following text conventions.

Figure 1	Blue text represents a cross-reference. For the online version of this guide, the reference is linked to the target.
www.hp.com	Underlined, blue text represents a website on the Internet. For the online version of this guide, the reference is linked to the target.
literal	Bold text represents literal values that you type exactly as shown, as well as key and field names, menu items, buttons, file names, application names, and dialog box titles.
variable	Italic type indicates that you must supply a value. Italic type is also used for manual titles.
input/output	Monospace font denotes user input and system responses, such as output and messages.
Example	Denotes an example of input or output. The display shown in this guide may not match your configuration exactly.
[ ]	Indicates an optional parameter.
{ }	Indicates that you must specify at least one of the listed options.
|	Separates alternatives in a list of options.

HP technical support

In North America, call technical support at 1-800-652-6672, available 24 hours a day, 7 days a week.

Outside North America, call technical support at the nearest location. Telephone numbers for worldwide technical support are listed on the HP website under support:

http://h18006.www1.hp.com/storage/arraysystems.html

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

For continuous quality improvement, calls may be recorded or monitored.

HP storage website

For the most current information about HP StorageWorks XP products, visit the support website. Select the appropriate product or solution from this website:

http://h18006.www1.hp.com/storage/arraysystems.html

For information about product availability, configuration, and connectivity, consult your HP account representative.

HP authorized reseller

For the name of your nearest HP authorized reseller, you can obtain information by telephone:

United States	1-800-345-1518
Canada	1-800-263-5868
Or contact:	www.hp.com

Revision history

October 2004   First edition

Warranty statement

HP warrants that for a period of ninety calendar days from the date of purchase, as evidenced by a copy of the invoice, the media on which the Software is furnished (if any) will be free of defects in materials and workmanship under normal use.

<u>DISCLAIMER.</u> **EXCEPT FOR THE FOREGOING AND TO THE EXTENT ALLOWED BY LOCAL LAW, THIS SOFTWARE IS PROVIDED TO YOU "AS IS" WITHOUT WARRANTIES OF ANY KIND, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. HP SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY, SATISFACTORY QUALITY, NON-INFRINGEMENT, TITLE, ACCURACY OF INFORMATIONAL CONTENT, AND FITNESS FOR A PARTICULAR PURPOSE.** Some jurisdictions do not allow exclusions of implied warranties or conditions, so the above exclusion may not apply to you to the extent prohibited by such local laws. You may have other rights that vary from country to country, state to state, or province to province.

<u>WARNING</u>! **YOU EXPRESSLY ACKNOWLEDGE AND AGREE THAT USE OF THE SOFTWARE IS AT YOUR SOLE RISK.** HP DOES NOT WARRANT THAT THE FUNCTIONS CONTAINED IN THE SOFTWARE WILL MEET YOUR REQUIREMENTS, OR THAT THE OPERATION OF THE SOFTWARE WILL BE UNINTERRUPTED, VIRUS-FREE OR ERROR-FREE, OR THAT DEFECTS IN THE SOFTWARE WILL BE CORRECTED. THE ENTIRE RISK AS TO THE RESULTS AND PERFORMANCE OF THE SOFTWARE IS ASSUMED BY YOU. HP DOES NOT WARRANT OR MAKE ANY REPRESENTATIONS REGARDING THE USE OR THE RESULTS OF THE USE OF THE SOFTWARE OR RELATED DOCUMENTATION IN TERMS OF THEIR CORRECTNESS, ACCURACY, RELIABILITY, CURRENTNESS, OR OTHERWISE. NO ORAL OR WRITTEN INFORMATION OR ADVICE GIVEN BY HP OR HP'S AUTHORIZED REPRESENTATIVES SHALL CREATE A WARRANTY.

LIMITATION OF LIABILITY. EXCEPT TO THE EXTENT PROHIBITED BY LOCAL LAW, IN NO EVENT INCLUDING NEGLIGENCE WILL HP OR ITS SUBSIDIARIES, AFFILIATES, DIRECTORS, OFFICERS, EMPLOYEES, AGENTS OR SUPPLIERS BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR OTHER DAMAGES (INCLUDING LOST PROFIT, LOST DATA, OR DOWNTIME COSTS), ARISING OUT OF THE USE, INABILITY TO USE, OR THE RESULTS OF USE OF THE SOFTWARE, WHETHER BASED IN WARRANTY, CONTRACT, TORT OR OTHER LEGAL THEORY, AND WHETHER OR NOT ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Your use of the Software is entirely at your own risk. Should the Software prove defective, you assume the entire cost of all service, repair or correction. Some jurisdictions do not allow the exclusion or limitation of liability for incidental or consequential damages, so the above limitation may not apply to you to the extent prohibited by such local laws.

NOTE. EXCEPT TO THE EXTENT ALLOWED BY LOCAL LAW, THESE WARRANTY TERMS DO NOT EXCLUDE, RESTRICT OR MODIFY, AND ARE IN ADDITION TO, THE MANDATORY STATUTORY RIGHTS APPLICABLE TO THE LICENSE OF THE SOFTWARE TO YOU; PROVIDED, HOWEVER, THAT THE CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS IS SPECIFICALLY DISCLAIMED AND SHALL NOT GOVERN OR APPLY TO THE SOFTWARE PROVIDED IN CONNECTION WITH THIS WARRANTY STATEMENT.

1

Installation

Installation of the HP StorageWorks Disk Array XP is performed by your HP service representative and you. The HP service representative installs the disk array and formats the disk devices. You configure the host server for the new devices with assistance from the HP service representative.

Features and requirements

The disk array and host have the following features and requirements.

- HP StorageWorks disk arrays:

  XP48: Up to 48 drives from 72 GB to 8.7 TB, 24 FC ports

  XP128: From 8 to 128 drives for up to 18 TB, 48 FC ports

  XP512: Up to 512 drives from 72 GB to 93 TB, 48 FC ports

  XP1024: From 8 to 1024 drives for up to 149 TB, 64 FC ports

- IBM NUMA-Q series enterprise system

- DYNIX/ptx operating system

- Host Bus Adapters (HBAs): Install adapters and all utilities and drivers. Refer to the adapter documentation for installation details.

- *(Recommended)* HP StorageWorks Command View XP with LUN management feature or Remote Control with the LUN Configuration Manager XP option for configuring disk array ports and paths.

- *(Recommended)* HP StorageWorks Secure Manager XP: Allows the host to access only array devices for which it is authorized.

- Other available XP Software (some may not apply to your system):
  HP StorageWorks Business Copy XP
  HP StorageWorks Continuous Access XP
  HP StorageWorks Continuous Access Extension XP
  HP StorageWorks Auto LUN XP
  HP StorageWorks Data Exchange XP
  HP StorageWorks Resource Manager XP
  HP StorageWorks RAID Manager XP
  HP StorageWorks Cache LUN XP
  HP StorageWorks Auto Path XP
  HP StorageWorks Cluster Extension XP
  HP StorageWorks Performance Advisor XP software

Fibre Channel interface

The XP48, XP128, XP512, and XP1024 disk arrays support these 1 Gbps and 2 Gbps Fibre Channel interfaces:

- Short-wave non-OFC (open fiber control) optical interface
- Multimode optical cables with SC or LC connectors
- Public or private arbitrated loop (FC-AL) or fabric direct attach
- Fibre Channel switches

Even though the interface is Fibre Channel, this guide uses the term "SCSI disk" because disk array devices are defined to the host as SCSI disks.

Device emulation types

The disk arrays support the following device emulation types:

- **OPEN-*x* devices:** OPEN-x logical units represent disk devices. Except for OPEN-V, these devices are based on fixed sizes. OPEN-V is a user-defined size. Supported emulations include OPEN-3, OPEN-8, OPEN-9, OPEN-E, OPEN-L, and OPEN-V devices.

- **LUSE devices (OPEN-*x**n):** Logical Unit Size Expansion (LUSE) allows you to combine 2 to 36 OPEN-x devices to create expanded LDEVs larger than standard OPEN-*x* disk devices. For example, an OPEN-x LUSE volume created from ten OPEN-x CVS volumes is designated as OPEN-x*10.

- **CVS devices (OPEN-x CVS):** Volume Size Configuration (VSC) defines custom volumes (CVS) that are smaller than normal fixed-sized logical disk devices (volumes). (OPEN-V is a CVS-based custom disk size that you determine. OPEN-L does not support CVS.)

- **LUSE (expanded) CVS devices (OPEN-x*n CVS):** LUSE CVS combines CVS devices to create an expanded device. This is done by first creating CVS custom-sized devices and then using LUSE to combine from 2 to 36 CVS devices. For example, if three OPEN-9 CVS volumes are combined to create an expanded device, this device is designated as OPEN-9*3-CVS.

Failover

The disk arrays support many standard software products that provide host, application, or I/O path failover and logical volume (storage) management.

SNMP configuration

The disk arrays support standard Simple Network Management Protocol (SNMP) for remotely managing the disk array from the host. The SNMP agent on the remote console PC or Command View can provide status and Remote Service Information Message (R-SIM) reporting to the SNMP manager on the host for up to eight disk arrays. To configure the SNMP manager on the host, refer to the operating system documentation.
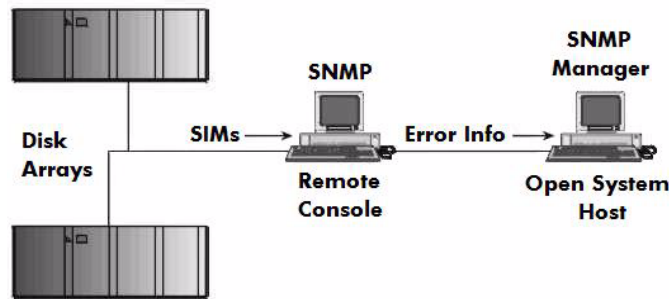
RAID Manager command devices

RAID Manager manages Business Copy (BC) and/or Continuous Access (CA) operations from a server host. To use RAID Manager with BC or CA, you must use Command View or LUN Configuration Manager to designate at least one LDEV as a command device. Refer to the Command View or LUN Configuration Manager user guide for information about how to designate a command device.

Installation procedures

The HP representative and you perform the following procedures:

Install and configure the disk array

The HP service representative performs the following tasks:

- Assembling hardware and installing software
- Loading the microcode updates
- Installing the channel adapters (CHAs) and cabling
- Installing and formatting devices

You perform the additional tasks below. If you do not have Command View or LUN Configuration Manager, your HP service representative can perform these tasks for you.

Setting the System Option Modes

The HP representative sets the System Option Mode(s) based on the operating system and software configuration of the host.

Configuring the Fibre Channel ports

Configure the disk array Fibre Channel ports by using Command View (shown) or the Fibre Parameter window in LUN Configuration Manager. Select the settings for each port based on your storage area network topology. Use switch zoning if you connect different types of hosts to the array through the same switch.
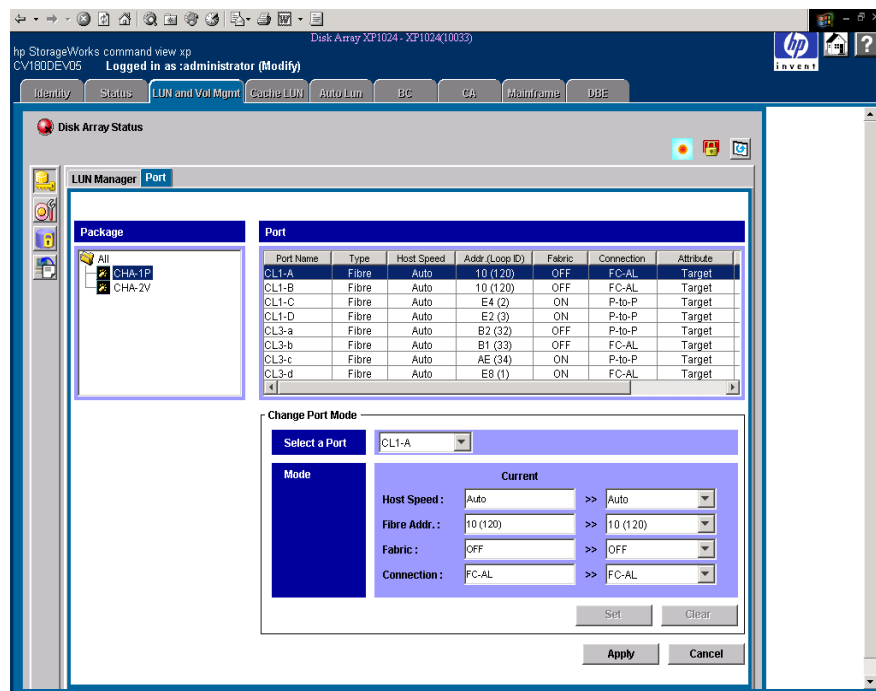
Fibre Address

In fabric environments, the port addresses are assigned automatically. In arbitrated loop environments, you set the port addresses by selecting a unique arbitrated loop physical address (AL-PA) or loop ID for each port.

Fabric and Connection parameter settings

You can set each array port to FABRIC ON or OFF with connections of POINT-TO-POINT or FC-AL as shown in the following table and figures. For detailed topology information, refer to the *HP StorageWorks SAN Design Reference Guide* on the hp.com website.

Simple Point-to-Point Fabric Topology Example
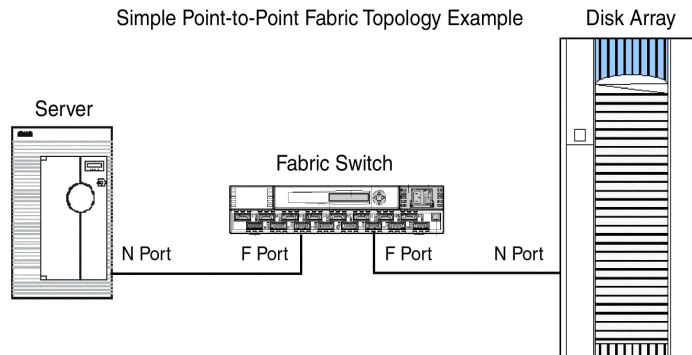
Fabric Parameter	Connection Parameter	Provides
ON	FC-AL	Not supported
ON	Point-to-Point	N-port (SAN fabric port)
OFF	FC-AL	Not supported
OFF	Point-to-Point	Not supported

Setting the Host Mode for the disk array ports

The disk array ports have Host Modes that you must set depending on the host you use. After the disk array is installed, use Command View (shown) or LUN Configuration Manager to set the Host Mode for each port.
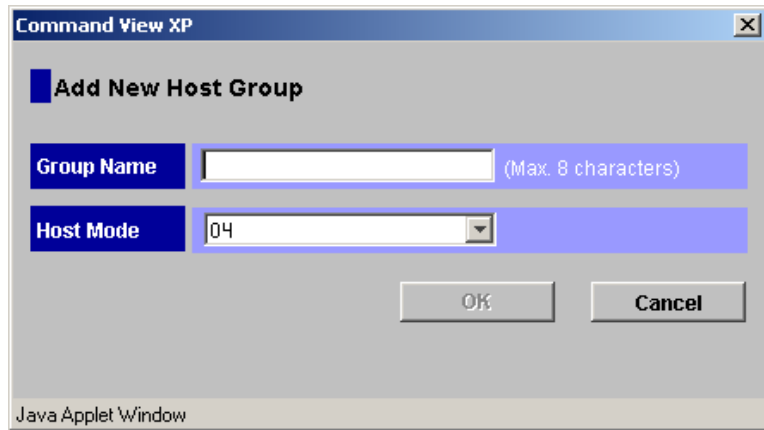
The host mode setting for DYNIX/ptx is **04**.

Install and configure the host

Install and configure the host and host bus adapters (HBAs) that connect the host to the disk array.

Loading the OS and software

Follow the manufacturer's instructions to load the operating system and software onto the host. Load all OS patches and configuration utilities supported by HP and the HBA manufacturer.

Installing and configuring the HBAs

Install and configure the host bus adapters using the HBA manufacturer's instructions.

Clustering and Fabric zoning

If you plan to use clustering, install and configure the clustering software on the servers. Clustering is the organization of multiple servers into groups. Within a cluster, each server is a node. Multiple clusters compose a multi-cluster environment. The following example shows a multi-cluster environment with three clusters, each containing two nodes. The nodes share access to the disk array.
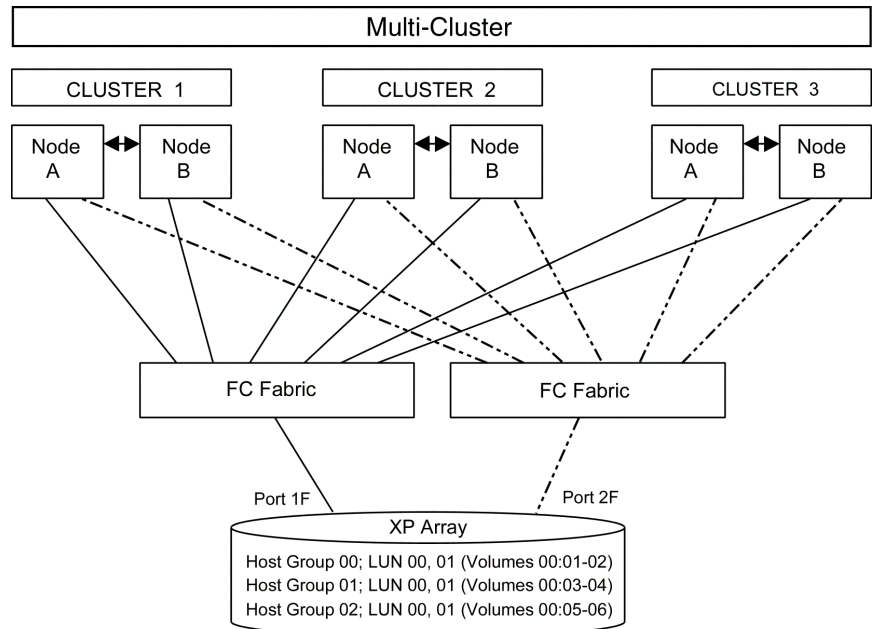
Within the Storage Area Network (SAN), the clusters may be homogeneous (all the same operating system) or they may be heterogeneous (mixed operating systems). How you configure LUN Security and fabric zoning depends on the operating system mix and the SAN configuration.

Fabric zoning and LUN security for multiple operating systems

By using appropriate zoning and LUN security, you can connect multiple clusters of various operating systems to the same switch and fabric:

- Host zones must contain only homogeneous operating systems.

- Storage port zones may overlap if more than one operating system needs to share an array port.

- Heterogeneous operating systems may share an XP array port if you use Secure Manager and set the appropriate host group and mode; all others must connect to a dedicated XP array port.

- Use Secure Manager for LUN isolation when multiple hosts connect through a shared array port. Secure Manager provides LUN security by allowing you to restrict which LUNs each host can access.

Environment	OS Mix	Fabric Zoning	LUN Security
Standalone SAN (non-clustered)	homogeneous (a single OS type present in the SAN)	Not required	Must be used when multiple hosts connect through a shared port
	heterogeneous (more than one OS type present in the SAN)	Required	
Clustered SAN	homogeneous (a single OS type present in the SAN)	Not required	Must be used when multiple cluster nodes connect through a shared port
	heterogeneous (more than one OS type present in the SAN)	Required	
Multi-Cluster SAN	homogeneous (a single OS type present in the SAN)	Not required	Must be used when multiple cluster nodes connect through a shared port
	heterogeneous (more than one OS type present in the SAN)	Required	

Connect the disk array

Connect the disk array to the host as follows:

1. The HP service representative verifies operational status of the disk array channel adapters, LDEVs, and paths.

2. The HP representative connects the Fibre Channel cables between the disk array and the fabric or host.

3. Verify the ready status of the disk array and peripherals.

Defining the paths

Use Command View (shown) or LUN Configuration Manager to create paths (LUNs) between hosts and volumes in the disk array, also called LUN mapping. LUN mapping includes these tasks:

- Configuring ports
- Setting LUN security
- Creating host groups by operating system and setting their host modes
- Assigning host bus adapter WWNs to host groups.
- Mapping volumes to host groups (by assigning LUNs).

For details, see the Command View or LUN Configuration Manager guide. HP recommends that you note LUNS and their ports, WWNs, nicknames, and LDEVs for later use in verifying host and device configuration.

HP StorageWorks Disk Array XP Operating System Configuration Guide: DYNIX/ptx
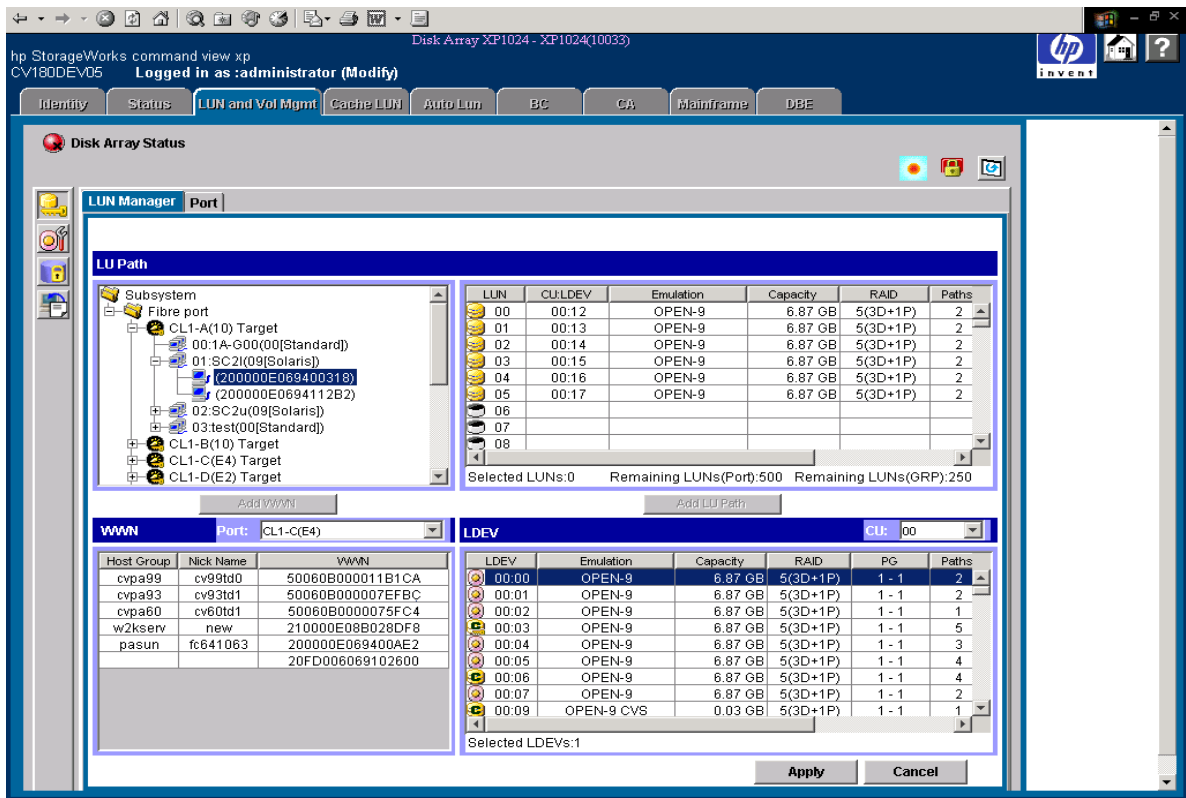
Verifying disk array device recognition

Verify that the host recognizes the disk array devices:

1. Log into the host as an administrator (root).

2. Check the list of peripherals on the host to verify the host recognizes all disk array devices. If any devices are missing, check disk array path configuration, check host HBA configuration, and check cables.

3. Record the disk numbers and other device information on the worksheet in Appendix A. You will need the disk numbers when you format, partition, and mount the disks.

Configure disk array devices

Configure the disk array devices in the same way you would configure any new disk on the host. Creating scripts to configure all devices at once may save you considerable time.

1. **Configuring devices typically requires these steps:** Initialize, partition, and label each device using the disk management utility provided with the host.

2. Create a file system for each device.

3. Create a mount directory for each device.

4. Enter each device into the mount table.

5. Reboot the host. Verify the devices mounted.

6. Verify file system operation by copying a test file to each device.

2

Troubleshooting

If you encounter an error condition, see "Error conditions" on page 26 for recommended actions.

If you are unable to resolve an error condition, ask your HP support representative for assistance. See "Calling the HP support center" on page 28.

Error conditions

Error Condition	Recommended Action
The logical devices are not recognized by the host.	Verify that the READY indicator lights on the disk array are ON.
	Verify that fiber cables are correctly installed and firmly connected.
	Verify that the target IDs are properly configured. The LUNs for each TID must start at 0 and continue sequentially without skipping any numbers.
	Verify that the TIDs/WWNs on each bus are unique. Do not install two devices with the same ID on the same bus.
	Recheck the buses for new devices.
	Verify that LUSE devices are not intermixed with normal LUNs on the same port.
	Verify that the maximum number of LUSE devices per port has not been exceeded.
	Verify that the disk array Host Mode is set correctly.
The host does not reboot properly after hard shutdown.	If you power off the host without executing the shutdown process, wait three minutes to allow the disk array's internal timeout process to purge queued commands. If the host restarts while the disk array is processing queued commands, the host may not reboot successfully.
Physical volumes cannot be created.	Verify that the disk array logical devices are correctly formatted.
Logical volumes cannot be created.	Verify that the volume capacity for OPEN-x volumes is not greater than the maximum capacity allowed. See the Device Emulations Appendix.
	Verify that the capacity of the volume group is not less than the total capacity of the partitioned logical volume.

Error Condition	Recommended Action
A file system is not mounted after rebooting.	Verify that the host was restarted correctly. Verify that the file system attributes are correct.
The disk array performs a self reboot because the disk array was busy or it logged a panic message.	Reboot the host.
The disk array responds "Not Ready" or the disk array has displayed "Not Ready" and timed out.	Contact HP.
The host detects a parity error.	Check the HBA and make sure it was installed properly. Reboot the host.
The host hangs or devices are declared and the host hangs.	Make sure there are no duplicate disk array TIDs and that disk array TIDs do not conflict with any host TIDs.

Calling the HP support center

If you need to call HP customer support, provide as much information about the problem as possible, including the circumstances of the error or failure and the exact content of any error messages.

Depending on your system configuration, you may be able to view error messages as follows:

- View SIMs in Command View (Device Health tab).
- View R-SIMs in Remote Control XP, including reference codes and severity levels of recent R-SIMs.
- View SIMs that generate SNMP traps on the host.

A

Worksheet

Path worksheet

LDEV (CU:LDEV) (CU = control unit)	Device Type	SCSI Bus Number	Path 1	Alternate Paths		
0:00				TID: LUN:	TID: LUN:	TID: LUN:
0:01				TID: LUN:	TID: LUN:	TID: LUN:
0:02				TID: LUN:	TID: LUN:	TID: LUN:
0:03				TID: LUN:	TID: LUN:	TID: LUN:
0:04				TID: LUN:	TID: LUN:	TID: LUN:
0:05				TID: LUN:	TID: LUN:	TID: LUN:
0:06				TID: LUN:	TID: LUN:	TID: LUN:
0:07				TID: LUN:	TID: LUN:	TID: LUN:
0:08				TID: LUN:	TID: LUN:	TID: LUN:
0:09				TID: LUN:	TID: LUN:	TID: LUN:
0:10				TID: LUN:	TID: LUN:	TID: LUN:
0:11				TID: LUN:	TID: LUN:	TID: LUN:
0:12				TID: LUN:	TID: LUN:	TID: LUN:
0:13				TID: LUN:	TID: LUN:	TID: LUN:

B

Disk array device emulations

This appendix provides information about disk array supported emulations and device type specifications. Some parameters may not be relevant to your array. Consult your HP representative for information about supported configurations for your system.

Supported emulations

XP Model	OPEN Emulation Type	OPEN Emulation Supported	LUSE	CVS	LUSE & CVS
XP48 XP512	OPEN-3	Yes	Yes	Yes	Yes
	OPEN-8	Yes	Yes	Yes	Yes
	OPEN-9	Yes	Yes	Yes	Yes
	OPEN-E	Yes	Yes	Yes	Yes
	OPEN-K	Yes	Yes	Yes	Yes
	OPEN-L	Yes	Yes		
	OPEN-M	Yes	Yes		
	OPEN-V				
XP128 XP1024	OPEN-3	Yes	Yes	Yes	Yes
	OPEN-8	Yes	Yes	Yes	Yes
	OPEN-9	Yes	Yes	Yes	Yes
	OPEN-E	Yes	Yes	Yes	Yes
	OPEN-K				
	OPEN-L	Yes	Yes		
	OPEN-M				
	OPEN-V	Yes	Yes		

Device type specifications

Device Type (Note 1)	Category (Note 2)	Blocks (512 bytes)	Sector Size (bytes)	# of Cylinders	Heads	Sectors per Track	Capacity MB* (Note 3)
OPEN-3	SCSI disk	4806720	512	3338	15	96	2347
OPEN-8	SCSI disk	14351040	512	9966	15	96	7007
OPEN-9	SCSI disk	14423040	512	10016	15	96	7042
OPEN-E	SCSI disk	28452960	512	19759	15	96	13893
OPEN-L	SCSI disk	71192160	512	49439	15	96	34761
OPEN-V	SCSI disk	max=125827200	512	Note 5	15	128	Note 6
LUSE							
OPEN-3*n	SCSI disk	4806720*n	512	3338*n	15	96	2347*n
OPEN-8*n	SCSI disk	14351040*n	512	9966*n	15	96	7007*n
OPEN-9*n	SCSI disk	14423040*n	512	10016*n	15	96	7042*n
OPEN-E*n	SCSI disk	28452960*n	512	19759*n	15	96	13893*n
OPEN-L*n	SCSI disk	71192160*n	512	49439*n	15	96	34761*n
OPEN-V*n	SCSI disk	max=125827200 Note 4	512	Note 5	15	128	Note 6
CVS							
OPEN-3 CVS	SCSI disk	Note 4	512	Note 5	15	96	Note 6
OPEN-8 CVS	SCSI disk	Note 4	512	Note 5	15	96	Note 6
OPEN-9 CVS	SCSI disk	Note 4	512	Note 5	15	96	Note 6
OPEN-E CVS	SCSI disk	Note 4	512	Note 5	15	96	Note 6
CVS LUSE							
OPEN-3*n CVS	SCSI disk	Note 4	512	Note 5	15	96	Note 6
OPEN-8*n CVS	SCSI disk	Note 4	512	Note 5	15	96	Note 6
OPEN-9*n CVS	SCSI disk	Note 4	512	Note 5	15	96	Note 6
OPEN-E*n CVS	SCSI disk	Note 4	512	Note 5	15	96	Note 6
OPEN-V*n	SCSI disk	Note 4	512	Note 5	15	128	Note 6

*Capacity = $(512 \times \text{number of blocks}) \div 1024^2$

Note 1: The availability of a disk type depends on the disk array.

Note 2: The devices are defined to the host as SCSI disk devices, even though the interface is Fibre Channel.

Note 3 The device capacity can sometimes be changed by the BIOS or host adapter board. This may make actual capacity different from that listed in the table.

Note 4: The number of blocks for a CVS volume is calculated as follows:
# of blocks = (# of cylinders) $\times$ (# of heads) $\times$ (# of sectors per track)

Example 1: For an OPEN-3 CVS volume with capacity = 37 MB:
# of blocks = (53 cylinders–see Note 5) $\times$ (15 heads) $\times$ (96 sectors per track) = 76320

Example 2: For an OPEN-V CVS volume with capacity = 49 MB:
# of blocks = (53 cylinders–see Note 5) $\times$ (15 heads) $\times$ (128 sectors per track) = 101760

Note 5: The number of cylinders for a CVS volume is calculated as follows ($\uparrow$ …$\uparrow$ means that the value should be rounded up to the next integer):

OPEN-3/8/9/E: The number of cylinders for a CVS volume =
# of cylinders = $\uparrow$ (capacity (MB) specified by user) $\times$ 1024/720 $\uparrow$

Example: For an OPEN-3 CVS volume with capacity = 37 MB:
# of cylinders = $\uparrow$ 37 $\times$ 1024/720 $\uparrow$ = $\uparrow$ 52.62 $\uparrow$ (rounded up to next integer) = 53 cylinders

OPEN-V: The number of cylinders for a CVS volume =
# of cylinders = $\uparrow$ (capacity (MB) specified by user) $\times$ 16/15 $\uparrow$

Example: For an OPEN-V CVS volume with capacity = 49 MB:
# of cylinders = $\uparrow$ 49 $\times$ 16/15 $\uparrow$ = $\uparrow$ 52.26 $\uparrow$ (rounded up to next integer) = 53 cylinders

OPEN-3/8/9/E: The number of cylinders for a CVS LUSE volume =
# of cylinders = $\uparrow$ (capacity (MB) specified by user) $\times$ 1024/720 $\uparrow$ $\times$ n

Example: For a CVS LUSE volume with capacity = 37 MB and n = 4
# of cylinders = ↑ 37 × 1024/720↑ × 4 = ↑ 52.62↑ × 4 = 53 × 4 = 212

OPEN-V: The number of cylinders for a CVS LUSE volume =
# of cylinders = ↑ (capacity (MB) specified by user) × 16/15 ↑ × n

Example: For an OPEN-V CVS LUSE volume with capacity = 49 MB and n = 4
# of cylinders = ↑ 49 × 16/15↑ × 4 = ↑ 52.26↑ × 4 = 53 × 4 = 212

Note 6: The capacity of an OPEN-3/8/9/E CVS volume is specified in MB, not number of cylinders. The capacity of an OPEN-V CVS volume can be specified in MB or number of cylinders. You set the volume size using the LUN Configuration Manager or Command View software.

Glossary

AL	Arbitrated loop.
AL-PA	Arbitrated loop physical address.
BC	HP StorageWorks Business Copy XP. BC lets you maintain up to nine local copies of logical volumes on the disk array.
CA	HP StorageWorks Continuous Access XP. CA lets you create and maintain duplicate copies of local logical volumes on a remote disk array.
Command View	HP StorageWorks Command View XP, a software product for managing XP arrays. Command View runs on a Windows-based management workstation.
command device	An LDEV that transfers RAID commands to BC or CA logical volumes.
CVS	CVS devices (OPEN-x CVS) are custom volumes that are smaller than normal fixed-sized logical disk devices (volumes).
DKC **(disk controller unit)**	The array cabinet that houses the channel adapters and service processor (SVP).
DKU **(disk cabinet unit)**	The array cabinets that house the disk array physical disks.
emulation modes	Emulation modes can be assigned to LDEVs to make them operate like standard OPEN system disk drives. The emulation mode of an LDEV determines its capacity. Refer to the appendices for device capacities.
FC	Fibre Channel.

FC-AL	Fibre Channel arbitrated loop.
FCP	Fibre Channel Protocol.
HBA	Host bus adapter.
HP	Hewlett-Packard Company.
LDEV	Logical device. An LDEV is created when a RAID group is divided into sections using a selected host emulation mode (for example, OPEN-9 or OPEN-M). The number of resulting LDEVs depends on the emulation mode. "LDEV" and "volume" are synonyms.
LUN	Logical unit number. A LUN results from mapping a SCSI logical unit number, port ID, and LDEV ID to a RAID group. The size of the LUN is determined by the emulation mode of the LDEV and the number of LDEVs associated with the LUN. For example, a LUN associated with two OPEN-3 LDEVs has a size of 4,693 MB.
LUSE	Logical Unit Size Expansion, a feature which logically combines LDEVs so they appear as a larger LDEV. This allows a LUN to be associated with 2 to 36 LDEVs. LUSE allows applications to access data requiring large amounts of disk space.
OFC	Open Fibre Control.
OPEN-*x*	A general term describing any one of the supported OPEN emulation modes (for example, OPEN-L).
OS	Operating system.
PA	Physical address.
path	"Path" and "LUN" are synonymous. Paths are created by associating a port, a target, and a LUN ID with one or more LDEVs.
port	A connector on a channel adapter card in the disk array. A port passes data between the disk array and external devices, such as a host server. Ports are named using a port group and port letter, for example, CL1-A.

RAID	Redundant array of independent disks.
remote console PC	The PC running HP StorageWorks Remote Control XP.
Remote Control (RC)	HP StorageWorks Remote Control XP. A software product used for managing XP arrays.
R-SIM	Remote service information message.
SCSI	Small computer system interface.
SIM	Service information message.
SNMP	Simple Network Management Protocol.
SVP	Service processor. A notebook computer built into the disk array. The SVP provides a direct interface to the disk array and is used only by the HP service representative.
TID	Target ID.
VSC	Volume Size Configuration is a feature that defines custom volumes (CVS volumes) that are smaller than normal fixed-sized logical disk devices (volumes).
WWN	World Wide Name. A unique identifier assigned to a Fibre Channel device.

Index

XP48
    support for 3
XP512
    support for 3

Z
zoning, fabric 19, 20